

MULTIMEDIA



UNIVERSITY

STUDENT ID NO

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MULTIMEDIA UNIVERSITY

FINAL EXAMINATION

TRIMESTER 1, 2019/2020

TPB3141 – PASSWORD AUTHENTICATION AND BIOMETRICS (All sections / Groups)

25 OCTOBER 2019
9.00 a.m – 11.00 a.m
(2 Hours)

INSTRUCTIONS TO STUDENTS

1. This question paper consists of 7 pages, excluding the cover page, with 5 questions only.
2. Attempt **ALL** questions. All questions carry equal marks and the distribution of the marks for each question is given.
3. Please print all your answers in the Answer Booklet provided.

Question 1:

Please attempt **ALL** multiple choice questions.

[12 marks]

1. Which of the following should be avoided when setting a password?
 - a. Include numerical characters only
 - b. Contain at least three combinations of numerical, symbol, and special characters
 - c. Can be used only a certain number of days
 - d. Password is not composed of character strings from the username

2. The distribution, authentication and revocation of _____ are the primary purposes of the public key infrastructure (PKI), the system by which public keys are distributed and authenticated.
 - a. digital certificate
 - b. storage token
 - c. dynamic token
 - d. password synchronization

3. Which of the following is NOT a common PKI use case?
 - a. Creating web pages without the need of SSL certificate
 - b. Authenticating nodes to wireless
 - c. Authenticating and encrypting emails
 - d. Validating VPN connections

4. A biometric _____ may consist of a score which designates the degree of similarity between the sample and the reference template.
 - a. match
 - b. enroll
 - c. feature extraction
 - d. image

5. It is a method used by identity thieves to capture information from a cardholder, such as take digital photos of information that can be used fraudulently.
 - a. Skimming
 - b. Mimicking
 - c. Spoofing
 - d. Threatening

Continued

6. _____ can operate through floor sensors, assessing unique patterns associated with an individuals' footsteps.
 - a. Gait biometrics
 - b. Thumbprint biometrics
 - c. Fingerprint biometrics
 - d. Face biometrics

7. Most of the _____ -based biometrics are unique and stable, thus making them more viable in high security application, i.e. airport.
 - a. Behavioral
 - b. Psychological
 - c. Psychosomatically
 - d. Physiological

8. _____ is a session and user authentication service that permits an end user to enter one set of login credentials (such as a name and password) and be able to access multiple applications.
 - a. Kerberos
 - b. Anti-virus
 - c. Firewall
 - d. Single Sign On

9. _____ refers to the center area of a fingerprint, whereas _____ is a pattern of a fingerprint that resembles the Greek letter Δ.
 - a. Core point; ridge ending
 - b. Delta; bifurcation
 - c. Bifurcation; ridge ending
 - d. Core point; delta

10. Which of the following is NOT TRUE about fingerprint biometrics?
 - a. Easily separates one individual from another
 - b. Possess high degree of robustness, speed, and accuracy
 - c. Twins are not sharing similar fingerprint patterns
 - d. Cannot resist aging

Continued

11. The need to maintain _____ is applicable to collected personal information, such as medical records, financial data, criminal records, political records, business related information or website data.
- personal privacy
 - digital copyright
 - telecommunication privacy
 - informational privacy
12. The _____ allows merchants to verify their customers' card information without actually seeing it, thus protecting the customer.
- ISO/IEC 27001
 - ISO 17799
 - Private Communication Technology
 - Secure Electronic Transaction

Continued

Question 2:

- a) Fill in the blanks with the most appropriate biometric terms and concepts:
- i. _____ : the process of collecting a biometric sample from an end user, converting it into a biometric reference, and storing it in the biometric system's database for later comparison.
 - ii. _____ : the process by which the biometric sample captured is transformed into an electronic representation.
 - iii. _____ : consists of data that represents the biometric measurement of an enrollee, used by a biometric system for comparison against subsequently submitted biometric samples.
 - iv. _____ : a physical device that carries an individual's credentials.
 - v. _____ : the one-to-many process of comparing a submitted biometric sample against all biometric reference templates on file.

[5 marks]

- b) Differentiate the technology of radio frequency identification (RFID) and near-field communication (NFC) and provide **ONE [1]** example for each of them.

[5 marks]

- c) Provide **TWO [2]** advantages of conventional password-based and token-based authentication systems when compared to biometric-based authentication.

[2 marks]

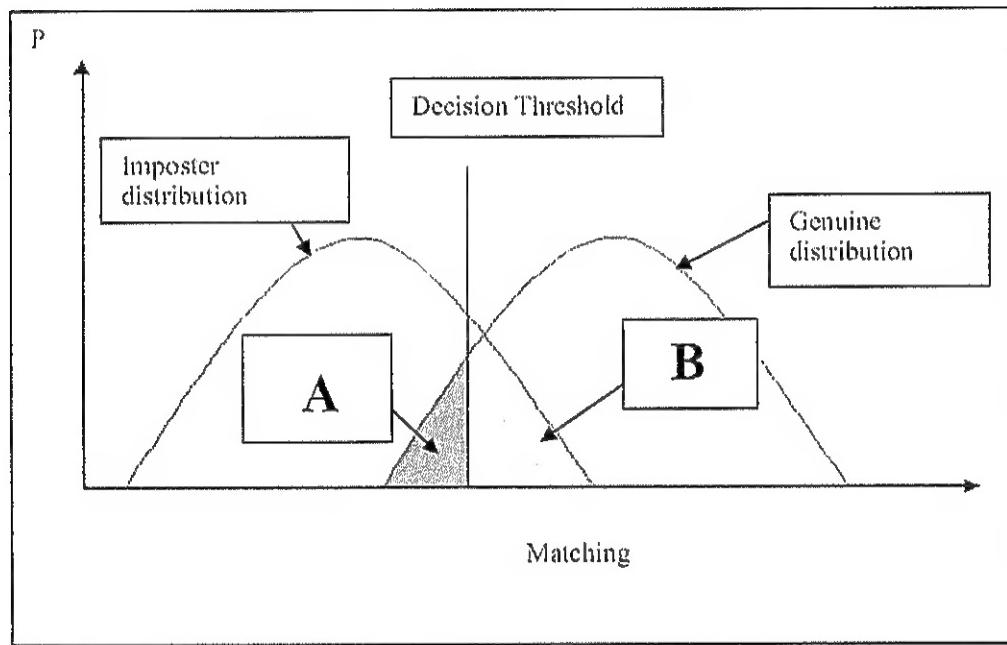
Continued

Question 3:

- a) In order to prevent password brute force attack, you used a very lengthy and complex password of “AfKcFz*%19bc0#^” for your online banking account. Do you think this is feasible? Discuss your opinion.

[4 marks]

- b) Differentiate the false acceptance rate (FAR) and false rejection rate (FRR) in a biometric solution. Identify and explain each of them from the figure below, specifically with the labels of A and B.



[4 marks]

- c) You are developing a fingerprint authentication system for an exam unit room of Multimedia University. Design and draw a flow diagram of your system by indicating the respective processes.

[4 marks]

Continued

Question 4:

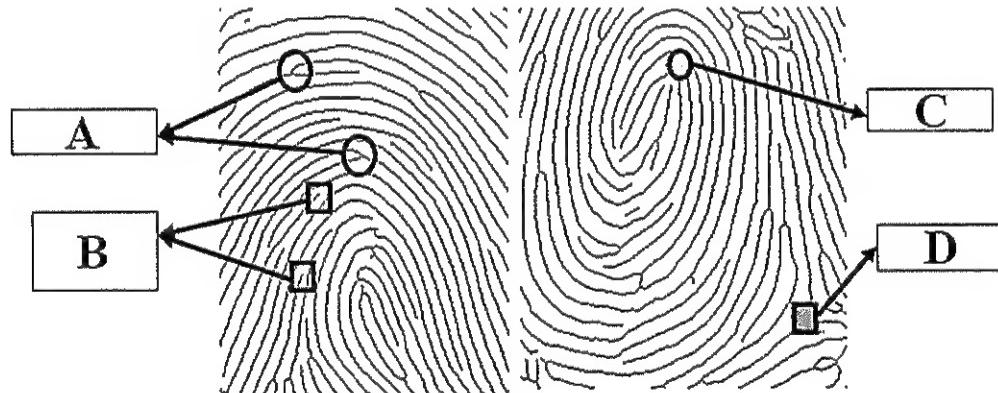
- a) Recently, biometric authentication and 6-Digit PIN are made available on the HSBC Malaysia Mobile Banking App. The customers can authenticate their identity and access their mobile banking in mere seconds – all with a simple look, *Face ID** through iOS phone. Evaluate the feasibility of this deployment by providing **FOUR [4]** benefits of face biometrics on phones.

[4 marks]

- b) Based on the Bioprivacy Technology Risk Rating, compare the positive and negative privacy aspects of adopting iris and keystroke in the application of biometric applications. Table your findings.

[4 marks]

- c) Given two fingerprints below, identify the components of **A**, **B**, **C** and **D** based on a given set of fingerprint ridge characteristics. [Choose 4 from here: *delta; core; island; ridge ending; crossover; bifurcation; pore; ridge dot; or ridge enclosure*].



[4 marks]

Continued

Question 5:

- a) *"Nuance Communications has unveiled a new artificial intelligence tool using fourth generation deep neural networks (DNNs) and combining voice biometrics and natural language understanding (NLU) for more personalized and human-like experiences across voice channels. In subsequent interactions, Nuance says the customer's identity is confirmed almost instantly through natural speech, with no passwords, knowledge-based questions, or the specific passphrase which has become industry standard for voice biometrics."*

Based on the statement given above, do you think it is text-dependent or text-independent voice biometrics? Justify your answer.

[3 marks]

- b) In May 2019, Apple patents smart fabric system that can sense temperature and odor based on changes in the user. Do you think this smart fabric system can be used as a biometric system too? Discuss your answer.

[4 marks]

- c) Secure Electronic Transaction (SET) is an open specification for handling credit card transactions over a network, with emphasis on the Web and Internet. How does it ensure all transferred data are encrypted and secured from sniffing attack? Explain your answer by drawing the SET transaction flow.

[5 marks]

End of Page